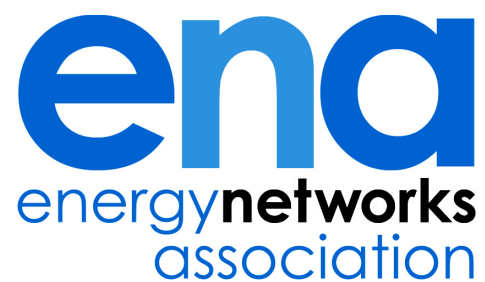


# **EHV Distribution Charging Methodology (EDCM)**

## **Report on Condition 3**

**June 2012**



## Report on EDCM Condition 3

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## Introduction

1. The electricity Distribution Network Operators (DNOs), through the Energy Networks Association (ENA), have jointly developed proposals for a new use of system charging methodology for higher voltage network users (the EDCM).
2. The DNOs' proposals for the EDCM for import (demand) and export (generation) were submitted by the ENA to Ofgem on 1 April 2011. Documents relating to this submission and previous consultations are available to download from the website of the ENA.<sup>1</sup>
3. On 6 September 2011, Ofgem published its decision to approve these proposals for **import charges only**, subject to several conditions.<sup>2</sup>
  - a) **Condition 1** relates to the methodology for calculating portfolio charges for Licensed Distribution Network Operators (LDNOs) serving customers who would have qualified for the Common Distribution Charging Methodology (CDCM) had they been connected directly to the host DNO. This condition had to be met by 30 November 2011.
  - b) **Condition 2** relates to the “sense checking mechanism” built in to the methodology to calculated locational LRIC charges. This condition had to be met by 30 November 2011.
  - c) **Condition 3** relates to the methodology for determining “network use factors”, which in turn determines the allocation of DNO costs and demand scaling to import tariffs. This condition has to be met by 1 June 2012.
4. DNOs have met Conditions 1 and 2. The revised EDCM methodology for import charges that reflected changes required by Conditions 1 and 2 was submitted to Ofgem on 30 November 2011. On 20 December 2011, Ofgem published its decision to approve the revisions to the original submission.<sup>3</sup> The revised EDCM for import charges, incorporating the changes for Conditions 1 and 2, came in to force on 1 April 2012.<sup>4</sup>
5. This report focuses on Condition 3. In particular, it proposes a new method to determine network use factors that, we believe, meets the requirements of Condition 3. Subject to approval by Ofgem, these proposals would replace the relevant provisions of the current EDCM methodology for import charges with effect from 1 April 2013 or later.
6. The DNOs have sought comments and views from stakeholders on these proposals through a consultation exercise carried out in April/May 2012.
7. This report is accompanied by the following appendices:

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<sup>1</sup> <http://2010.energynetworks.org/structure-of-charges-edcm/>

<sup>2</sup> Ofgem (2011) Electricity distribution charging: decision on the methodology for higher voltage import charges, ref 116/11

<sup>3</sup> Ofgem letter dated 20 December 2011. Available from <http://www.ofgem.gov.uk/Networks/ElecDist/Policy/DistChrgs/Pages/DistChrgs.aspx>

<sup>4</sup> See Schedules 17 and 18 of the Distribution Connection and Use of System Agreement (DCUSA), available from [www.dcusa.co.uk](http://www.dcusa.co.uk)

- a) Appendix 1 contains the proposed method for calculating network use factors as a “tracked change” version of the relevant extracts from the EDCM methodology statements set out in Schedules 17 and 18 of DCUSA.
- b) Appendix 2, attached as a Microsoft Excel workbook, gives, for each of the 14 DNO licence areas in Great Britain, illustrative demand (import) charges that might have resulted from the application of the new proposed method to calculate network use factors in 2012/2013. These have been calculated using the current approved “demand-only” EDCM models.

### **How to interpret the illustrative results in Appendix 2**

- 8. Given the feedback received, we have amended Appendix 2 to show the impact on annual charges that would have resulted from the new method for calculating NUFs. They compare the effect of introducing the new NUFs in the 2012/13 charging models to the 2012/13 charges that were published in February 2012.
- 9. The tariff numbers are necessary to retain the anonymity of end users, however, DNOs are happy to provide confirmation to relevant stakeholders.

### **Responses to our consultation**

- 10. We published a consultation document describing our draft proposals on 20 April 2012. This document and accompanying appendices are available to download from the ENA website.<sup>5</sup>
- 11. We received two responses to our consultation, one from British Gas (BG), and the other from RWE npower (RWE).
- 12. In responses to the formal consultation questions, the respondents stated the following:
  - a) Both felt that the DNOs’ draft proposals were sufficient to meet the requirements of Ofgem’s Condition 3.
  - b) Both agreed with the DNOs’ position that NUFs for generation-dominated mixed sites should be set to default values (equal to the collar).
  - c) Both raised concerns about the potential impact of implementing the new proposals on use of system charges to customers. The RWE response said that the extent of change to charges should be taken into account in setting an implementation date. BG made the same point, and suggested that an implementation date of 1 April 2014 would give customers more time to factor in these changes.
- 13. British Gas argued that CDCM customers, in general, are less likely to “drive” spare capacity on the 132kV and EHV network, given their large numbers and the fact that they are located further down the network compared to EDCM customers. BG

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<sup>5</sup> <http://www.energynetworks.org/electricity/regulation/commercial-operations-group/charging-structure/use-of-system/development/structure-of-charges-edcm/consultation-files/edcm-condition-3-consultation-20-april-2012.html>

recommends that should the DNOs' proposals be approved by Ofgem, this issue be further investigated under open governance.

14. RWE criticised the presentation of data relating to the impact on customer charges in the appendix accompanying the main consultation document. According to the response, the data were not presented in a transparent manner and was difficult to interpret.
15. We have taken this criticism on board and have changed the presentation of the results of our analysis. We hope this would help Ofgem and stakeholders better understand the impact of these proposals on charges. Stakeholders should contact DNOs directly if they have any remaining questions.

#### **What are “Network Use Factors”?**

16. Under the approved EDCM for import (demand) tariffs, the modern equivalent asset value (MEAV) of “notional” network assets that are deemed to be used by each demand user is one of the main drivers of DNO cost and revenue allocation.
17. The MEAV of notional assets that are deemed to be used by the EDCM demand customer group (taken together) determines the allocation of the following elements between EDCM and CDCM (typically HV and LV) customers:
  - a) The DNO's direct operating costs, indirect costs and network rates.
  - b) The DNO's residual revenue, which represents the amount of DNO allowed revenue that has not been already identified and allocated.
18. Once the allocation of these elements to the EDCM customer group has been calculated, a set of “adjusted” notional assets are used to determine the allocation of the EDCM group aggregates to individual EDCM demand customers.
19. “Network use factors” are a key input to determining notional assets and adjusted notional assets at each network level specific to each demand user. These network use factors are determined using power flow analysis.
20. A network use factor (NUF) is defined as the notional value of assets at a given network level required to supply a unit of power to a specific EDCM demand customer relative to the average notional value of assets at the same network level required to supply a unit of power to CDCM customers.
21. For example, a NUF of 2 at the 132 kV network level implies that the EDCM customer is deemed to use twice as much assets (in MEAV terms) per unit of power as the average MEAV of assets per unit of power deemed to be used by CDCM customers.
22. The assets each customer is deemed to use are those through which there is a material change on flow due to a small change in demand applied at the relevant node (i.e. the node or location at which that customer is connected) and are collectively referred to as the ‘notional path’. The changes in flow through each asset are converted to ‘MW usage’ values, and these values form the basis of the allocation of the cost of the asset:

$$\text{Alloc (£/year)} = ([\text{MW usage}] / [\text{Total MW usage}]) * \text{AMEAV}$$

Where:

Alloc is the allocation of the AMEAV of the asset to a demand user in £/year

MW usage is the absolute value of the “MW usage” of the asset attributable to that demand user (expressed in MW). The method to calculate MW usage is described in the EDCM methodology statement (See “Derivation of network use factors”).

Total MW usage is the sum of the absolute values of the “MW usage” of all demand users of that asset (expressed in MW)

AMEAV is the annualised modern equivalent asset value in £/year of that asset

23. The above relationship was so constructed in recognition of the fact that different users of an asset may be in opposing directions. Further, it demonstrates the inherent dependence of the allocation of the cost of an asset on the (types of) users deemed to use the asset.
24. The methodology divides users into the following types:
  - a) CDCM demand;
  - b) EDCM demand;
  - c) EDCM demand at demand-dominated mixed use sites;
  - d) EDCM demand at generation-dominated mixed use sites; and
  - e) EDCM generation at generation-dominated at mixed uses sites.
25. Network use factors are produced for only the first three types of users.
26. The network use factors are then used to estimate the notional asset usage of each demand customer.
27. Each network use factor is then subjected to a “cap and collar” specific to each network level to calculate “adjusted network use factors”. These adjusted NUFs are used to calculate the adjusted set of notional assets
28. For EDCM demand customers at generation-dominated mixed use sites, a default value is set for the network use factors. This default value is set equal to the collar applicable to that network level.
29. The caps and collars for each network level in the approved EDCM methodology is set out in table 3.

### **Condition 3 – To review the method for calculating network use factors**

30. Condition 3 of Ofgem’s approval of the EDCM relates to the methodology for determining network use factors.

31. Under the current method of calculating network use factors, the entire cost of an asset is apportioned to those deemed to use it. This is true even if a portion of the asset capacity is “unused” or “spare”.
32. The condition requires the DNOs to carry out further investigations into the issue of spare capacity, which is “that the full value of the asset is allocated amongst the customers that use it at maximum demand, even if there is unused capacity (“spare capacity”) on the asset.”
33. In particular, the DNOs must submit a report to Ofgem by 1 June 2012 that does the following:

“Examine the circumstances in which it may or may not be appropriate to socialise spare capacity costs and the different options which could be used to do this.

Assess the materiality of the impact on customers’ charges and whether these can be justified.

Provide a well reasoned recommendation to change the methodology or a well reasoned report saying why no change is necessary.”
34. In addition, Ofgem also expects the DNOs to “consider whether the use of default network use factors in generation-dominated sites is still appropriate”.

### **Taking account of contingency conditions**

35. In its May 2011 consultation on the EDCM, Ofgem had raised another issue with the DNO’s proposed method to calculate network use factors.<sup>6</sup> This issue related to the lack of consideration of contingency conditions in calculating these factors.
36. However, in its September 2011 decision, Ofgem said that “on balance we consider that calculating NUFs on the basis of power flows under an intact network was a reasonable and pragmatic approach.”
37. The DNOs acknowledge that network use factors are generated by way of the application of increments of demand to intact networks and do not capture asset usage under contingency conditions.
38. The DNOs believe that is an area in which the methodology may be improved even though Ofgem has suggested that this is a reasonable approach.
39. Consequently, the proposed method for determining “spare capacity” takes account of asset usage under contingency conditions. This is described in the next section.

### **Assessment of the treatment of spare capacity costs**

40. On the issue of spare capacity, Ofgem states in its May 2011 consultation document that:

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<sup>6</sup> Ofgem (2011) Electricity distribution charging methodologies: Distribution network operators’ (DNOs’) proposals for the higher voltages, ref 67/11

“We think there might be an argument that where there is spare capacity on assets that are not used by anyone, it might instead be appropriate to recover the associated costs from all network users, through the scaling process.”

41. Further, in its September 2011 decision document, Ofgem states that:

“Respondents to our consultation generally agreed that costs associated with spare capacity should not necessarily be borne by the user of the asset. At the same time, a number of respondents suggested that this issue may require further work in order to understand the circumstances in which it arises and the impact on customers. For example, where assets are available only in certain capacities (ie they are indivisible so there is some built in natural spare capacity), it may not be appropriate for the difference between the customer’s capacity and the rated capacity of the asset to be recovered from other users.”

42. The words “spare capacity” are somewhat ambiguous and, instead, the DNOs propose that the capacity of an asset may be categorised as follows:

- a) *Base flow capacity* – the capacity required to satisfy the maximum flow through the asset during normal operating conditions.
- b) *Security of supply capacity* – the additional capacity in excess of the base flow capacity required to accommodate the maximum post-contingent flow through the asset.
- c) *Unused capacity* – the capacity of the asset that remains unused even with the accommodation of the maximum post-contingent flow. It is assumed that it is this has been referred to by Ofgem as ‘spare capacity’.

43. We have interpreted the words “socialise spare capacity costs” in Condition 3 to refer to a method that would recover the costs associated with unused capacity from all demand users of the network, rather than solely from the users of the assets that make up the unused capacity.

44. There are valid reasons why unused capacity may exist; some of these are:

- a) Asset capacity is not a continuous variable. Rather, it is a discrete variable that can be increased or decreased only in discrete increments. Installed asset capacity is hardly ever likely to match that required for security of supply even if ‘future-proofing’ is not a consideration.
- b) Network operation and expansion is constituted of the assessment of a number of factors other than (demand) utilisation of assets. Unused capacity may arise out of the necessity of the consideration of other operating parameters.

45. The DNOs acknowledge that Ofgem and the stakeholders that have responded to Ofgem’s May consultation believe that the cost of this unused capacity should be shared between all demand users of the network.

46. According to the current EDCM methodology for demand tariffs, two sets of network use factors are used:



- a) The unadjusted network use factors are used to determine the allocation of total DNO costs and residual revenue between EDCM customers and CDCM customers.
  - b) A second, adjusted, set of network use factors are used to determine the allocation of the EDCM share of total DNO costs and residual revenue between EDCM demand customers.
47. As recognised in Ofgem's May consultation document, the issue of spare capacity applies to assets that may be used by CDCM as well as EDCM users.
48. The DNOs believe that, in the interests of fairness, both CDCM and EDCM demand customers should receive the same treatment on spare capacity. Therefore, any modification to the methodology to take account of spare capacity should apply to the calculation of both sets of network use factors.

### **The proposed new method for network use factors**

49. In the May 2011 consultation document, Ofgem proposed a modification to the apportionment formula for calculating network use factors so that allocation is based on asset capacity as follows:<sup>7</sup>

$$\text{Alloc (£/year)} = ([\text{MW usage}] / [\text{Rating}]) * \text{AMEAV}$$

Where:

Alloc is the allocation of the AMEAV of the asset to a demand user in £/year

MW usage is the absolute value of the "MW usage" of the asset attributable to that demand user (expressed in MW)

Rating is the unadjusted rated capacity of the asset in MVA

AMEAV is the annualised modern equivalent asset value in £/year of that asset

50. The unintended consequence of this proposal is that total cost allocation may be greater than the MEAV of the asset in some instances because the bi-directional nature of flow through assets is not accounted for as it was in the original formula proposed by the DNOs. The DNOs do not think this is appropriate.
51. An alternative approach is proposed which relies on a fundamental feature of the Long Run Incremental Costing (LRIC) methodology and serves as an approximation of the assessment of all credible outage scenarios upon application of the increment of demand.
52. Under the DNO's proposed new approach, the allocation may be calculated using one of two equations.
53. The first equation multiplies the equation in the current EDCM by the "asset utilisation factor", to remove costs relating to the amount of capacity that is unused or spare.

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<sup>7</sup> Electricity Distribution Charging Methodologies: DNOs' proposals for the higher voltages, May 2011, Ref 67/11

54. The second equation applies when the asset in question is deemed to be “generation-dominated”, where generation domination is determined according to the rule in the formula below. In the case of generation-dominated asset, a “load utilisation factor” is used to allocate only a part of the asset cost to demand.

55. The new method to determine asset allocations to demand are:

$$\text{Alloc (£/year)} = ([\text{MW usage}] / [\text{Total MW usage}]) * (\text{Abs} [\text{Max contingency flow}] / [\text{Rating}]) * \text{AMEAV}$$

*If the branch is “generation-dominated”, or  $(2 * \text{Abs} [\text{Base flow load}]) \leq \text{Abs} ([\text{Base flow}] - [\text{Base flow load}])$ , then use:*

$$\text{Alloc (£/year)} = ([\text{MW usage}] / [\text{Total MW usage}]) * (\text{Abs} [\text{Max contingency flow}] / [\text{Rating}]) * \text{Abs} ([\text{Base flow load}] / [\text{Base flow}]) * \text{AMEAV}$$

Where:

Alloc is the allocation of the AMEAV of the asset to a demand user in £/year

MW usage is the absolute value of the “MW usage” of the asset attributable to that demand user (expressed in MW)

Total MW usage is the sum of the absolute values of the “MW usage” of all demand users of that asset (expressed in MW)

Max contingency flow is the maximum post-contingent flow through the asset in MVA. The maximum post-contingency asset flows may be extracted from the ‘locational’ analyses.

Rating is the unadjusted rated capacity of the asset in MVA

Base flow load is the algebraic sum of power flows through the branch due to demand only in MW

Base flow is the aggregate power flow through the branch under normal network operation in MW

AMEAV is the annualised modern equivalent asset value in £/year of that asset

The ratio  $([\text{Max contingency flow}] / [\text{Rating}])$  is called the asset utilisation factor and it is capped at 1. This factor is used when the asset is not deemed to be generation-dominated.

The quantity  $(\text{Abs} [\text{Max contingency flow}] / [\text{Rating}]) * \text{Abs} ([\text{Base flow load}] / [\text{Base flow}])$  is called the load utilisation factor.

56. Annex 1 explains the proposed methodology using different example network configurations.

57. All three configurations in Annex 1 result in a lower allocation of asset costs to the demand customer under the new methodology, as long as there is some unused capacity in the branch in question.

### **How our proposed method meets the requirements of Condition 3**

58. The DNOs have identified the following as the benefits of the new method:
- a) It is more cost-reflective as it allocates only the proportion of the asset annuitized MEAV, which is deemed to be used by customers, to that EDCM customer.
  - b) It allocates the costs associated with unused capacity on the network to all demand users of the network (EDCM and CDCM) rather than just to users of the assets that make up unused capacity (i.e. “socialises” the spare capacity costs) .
  - c) It is consistent with the principles of the network assessment, it considers contingency scenarios and represents actual management and design of the network which would drive reinforcement requirements.
  - d) It prevents the over allocation of the MEAV of lightly utilised assets to EDCM customers.
59. For these reasons, the DNOs believe that the proposed method meets the requirements of Condition 3.

### **Default NUFs for generation-dominated mixed sites**

60. Under the current EDCM, network use factors for the import tariffs of a mixed import-export site that is generation-dominated are set to default values.<sup>8</sup> These default values are equal to the “collars” for each network level. Ofgem have asked the DNOs to consider whether the use of default values for such sites is still appropriate.
61. The current methodology for determining network use factors for demand customers allocates the “full” cost of an asset between the demand customers that are deemed to use it.
62. In cases where the demand customer is the import tariff associated with a generation-dominated mixed site, this allocation may be excessive and unreasonable since the asset may exist primarily to accommodate generation export.
63. Consequently, the current methodology attempts to address this by setting the network use factors of such sites to default values (equal to the collar).
64. The new method proposed in this document goes some way towards addressing the original problem, by including a “load utilisation” factor in the calculation of asset allocations. The load utilisation factor, which is the absolute value of the ratio of “Base flow load” to “Base flow” through the asset, is a proxy measure for the extent to which the asset is utilised by demand customers rather than generation.
65. The DNOs are still not convinced that the proposed method addresses all the issues relating to mixed demand-generation sites.

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<sup>8</sup> Generation-dominated sites are determined according to the rules set out in the EDCM methodology (LRIC section) to determine whether a location is to be modelled as a generation site.

66. A major concern is that the load utilisation factor only considers flows during the “maximum demand scenario”. Flows that are due to generation that may occur at other times are not considered, and therefore would not affect the ratio.
67. Another problem is highlighted by the illustrations in annex 1. Examples B and C show networks where the asset in question serves both demand and generation. In Example C, where the generation capacity is higher, the asset allocation to demand is greater. This reflects the higher asset utilisation factor (due to higher assumed post-contingency flow) for that asset. We do not think this is appropriate for generation-dominated mixed sites.
68. Consequently, the DNOs believe that it is still appropriate to set the network use factors for such mixed sites equal to the collar for each network level.

### **Updating the caps and collars for network use factors**

69. Under the current EDCM for import charges, a common set of caps and collars apply to the network use factors and these are applied for the purpose of allocating costs and demand scaling to individual EDCM customers, i.e. “adjusted” network use factors.
70. These caps and collars have been calculated as follows:
- a) In ascending order, list the network use factors for all demand users in all DNO areas relating to that network level, excluding all the factors that are either equal to zero or 1, or not used, based on the customer categories of each demand user.
  - b) Divide the list into two segments, one that contains factors that are lower than 1, and the other than contains the factors that are higher than 1.
  - c) Take the list segment containing factors that are lower than 1. Starting from the lowest factor in this list segment, calculate the factor at the 15<sup>th</sup> percentile. This is the collar.
  - d) Take the list segment containing factors higher than 1. Starting from the lowest factor in this segment, calculate the factor at the 85<sup>th</sup> percentile. This is the cap.
71. The caps and collars are fixed and have been used to calculate illustrative tariffs for 2011/2012 and actual tariffs for the charging year 2012/2013. Under the current methodology, these caps and collars would also be used to calculate tariffs for 2013/2014. The caps and collars would be re-calculated for the subsequent three charging years using the averages of the network use factors for each tariff for the previous three years.
72. If the methodology for calculating the network use factors is modified to take account of spare capacity, the DNOs think that it is appropriate to update the caps and collars as well. If so, the new caps and collars would be fixed, and would be used to calculate illustrative tariffs for 2012/2013, and actual tariffs for 2013/2014 and 2014/2015. Caps and collars for the subsequent three years would be re-calculated using the averages of the network use factors for each tariff for the previous three years.

73. The caps and collars for each network level in the approved EDCM methodology, and new caps and collars calculated based on the network use factors using the new methodology, are set out in table 1 below.

**Table 1 Current and new network use factor caps and collars**

Network levels	Collar		Cap	
	Current	New	Current	New
132 kV	0.273	0.227	2.246	2.282
132kV/EHV	0.677	0.702	1.558	1.524
EHV	0.332	0.360	3.290	2.610
EHV/HV	0.631	0.583	2.380	1.585
132kV/HV	0.697	0.606	2.768	2.819

### **Impact of the proposal on demand customers**

74. The DNOs have applied the proposed methodology to analyse and demonstrate the impact of modifying the EDCM. Input data relevant to the charging year 2012/2013 has been used for this purpose. Full illustrative results for all DNO areas are set out in Appendix 2 accompanying this report.
75. The primary objective of Condition 3 is to ensure the appropriate allocation of “spare capacity” on the distribution network while calculating EDCM demand tariffs. The DNOs have carried out some analysis on this aspect.
76. A sample of demand customers that were originally adversely affected by the spare capacity issue were selected for investigation, and the preliminary results indicate that, in those cases at least, the new method results in lower network use factors and forecast final charges. A few examples are presented below:
- Tariff number 1 (132kV NUF reduced from 13.8 to 1.9) in the WPD East Midlands area and tariff 10 (132kV/EHV NUF reduced from 4.9 to 1.3) in the WPD West Midlands area.
  - Tariff number 8 (132kV/EHV NUF reduced from 29.89 to 1.945) in the SPEN SPM area and tariff 62 (EHV NUF reduced from 15.573 to 4.760) in the SPEN SPD area.
  - Tariff number 91 (EHV/HV NUF reduced from 3.063 to 0.456) in the NPG Yorkshire area and tariff 25 (EHV/HV NUF reduced from 18.168 to 0.752) in the NPG Northeast area.
  - Tariff number 88 (132kV NUF reduced from 7.99 to 0.96) in the SSEPD SEPD area and tariff 208 (EHV NUF reduced from 15.19 to 1.25) in the SSEPD SHEPD area.

77. However, the application of the new methodology has resulted in increased NUFs for demand customers who are deemed to use assets that have very little spare capacity relative to CDCM users. A few examples of such increases are presented below:
- a) Tariff number 75 (132kV NUF increased from 0.6 to 1.1) in the WPD East Midlands area and tariff 4 (132kV/EHV NUF increased from 1.9 to 2.7) in the WPD West Midlands area.
  - b) Tariff number 61 (132kV NUF increased from 0.722 to 1.045) in the SPEN SPM area and tariff 61 (EHV NUF increased from 0.549 to 0.859) in the SPEN SPD area.
  - c) Tariff number 82 (EHV NUF increased from 0.9 to 1.4) in the NPG Yorkshire area.
  - d) Tariff number 106 (132kV NUF increased from 1.58 to 2.46) in the SSEPD SEPD area and tariff 201 (EHV NUF increased from 0.65 to 1.4) in the SSEPD SHEPD area.
78. The rest of this section sets out results of our analysis at a more aggregate level.
79. Table 2 below sets out the estimated impact on forecast aggregate EDCM demand revenue for 2012/2013. Normally, an increase in forecast aggregate EDCM demand revenue would result in a corresponding decrease in the target aggregate revenue from CDCM charges (for HV and LV customers), and vice versa.

**Table 2 Summary analysis of the impact on aggregate EDCM demand revenue**

<b>DNO area</b>	<b>Forecast EDCM demand revenue in 2012/2013 Current method £/year</b>	<b>Forecast EDCM demand revenue in 2012/2013 New method £/year</b>	<b>Change in forecast EDCM demand revenue £</b>
ENW	11,746,050	10,661,793	-1,084,257
NPG Northeast	5,503,331	4,948,905	-554,426
NPG Yorkshire	8,440,040	8,874,479	434,438
SPEN SPD	3,542,860	3,339,224	-203,637
SPEN SPM	29,082,014	26,926,787	-2,155,227
SSEPD SEPD	14,027,473	10,850,524	-3,176,949
SSEPD SHEPD	1,891,664	1,590,677	-300,987
UKPN EPN	12,341,749	12,482,087	140,338
UKPN LPN	6,236,241	5,428,208	-808,032
UKPN SPN	6,685,349	6,394,734	-290,614
WPD East Midlands	9,969,053	7,617,845	-2,351,208
WPD West Midlands	2,988,638	2,894,590	-94,048
WPD South Wales	15,310,384	15,863,926	553,542
WPD South West	3,562,167	3,194,699	-367,467

80. Table 3 below sets out summary statistics on the impact of the change on individual demand tariffs. Again, data used relate to 2012/2013.

**Table 3 Summary of the impact on individual EDCM demand customers (2012/2013)**

DNO area	Number of demand tariffs forecast to increase	Maximum forecast increase £	Number of demand tariffs forecast to decrease	Maximum forecast decrease £
ENW	7	30,726	74	-108,715
NPG Northeast	4	30,475	40	-99,725
NPG Yorkshire	87	59,006	22	-60,030
SPEN SPD	26	26,843	51	-108,346
SPEN SPM	21	13,252	183	-145,372
SSEPD SEPD	2	1,535	93	-292,486
SSEPD SHEPD	3	32,321	179	-114,330
UKPN EPN	59	284,914	46	-85,046
UKPN LPN	1	12	31	-85,046
UKPN SPN	9	16,444	39	-40,211
WPD East Midlands	1	20,543	75	-188,516
WPD West Midlands	3	72,567	23	-36,294
WPD South Wales	12	850,705	24	-168,455
WPD South West	4	2,508	25	-52,011

## Conclusions and recommendation

81. The DNOs believe that the proposals set out in this document meet the requirements of Ofgem's Condition 3.
82. The DNOs have considered the impact of the new proposals on charges to EDCM demand customers:
  - a) The proposed NUF calculation methodology better accounts for spare capacity of network assets. Where assets have significant spare capacity, the NUF values have generally decreased and the recovered revenues from EDCM demand customers using these assets has reduced. In some cases, this effect is quite significant.
  - b) Network assets at higher voltages are used by EDCM and CDCM customers. NUF values reflect the relative usage of assets by EDCM customers compared



to the asset usage by CDCM customers. Under the new methodology, taking account of spare capacity could reduce the average usage of assets by CDCM customers by more than the reduction in asset usage by EDCM customers. In such cases, the NUF values for EDCM customers have increased, leading to an increase in their forecast EDCM demand charges. In a few cases, this increase is substantial. In the vast majority of cases, however, this increase is small or modest.

- c) The impact of the new NUF cap and collar is very small and charges are generally less than with the original NUF cap and collar.

- 83. We recommend (following Ofgem's review and removal of Condition 3) that these proposals be progressed through the governance process with the intent of implementing them.

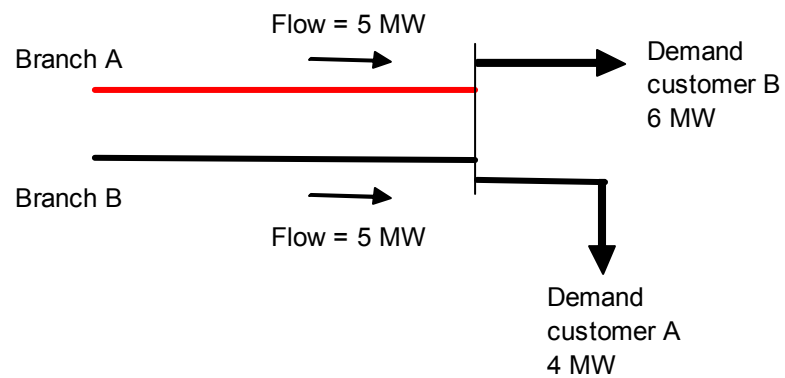
## Glossary

Term	Explanation
Allowed Revenue	The amount of money that a network company may collect in respect of Use of System Charges.
CDCM	The common distribution charging methodology. (The average charging model used for setting charges for high-voltage and low-voltage connections.) See Schedule 16 of the Distribution Connection and Use of System Agreement (DCUSA), available from <a href="http://www.dcusa.co.uk">www.dcusa.co.uk</a> .
EDCM	One of two distribution charging methodologies (FCP or LRIC) for higher voltage users. See Schedules 17 and 18 of the Distribution Connection and Use of System Agreement (DCUSA), available from <a href="http://www.dcusa.co.uk">www.dcusa.co.uk</a> .
EHV	In this document, EHV normally refers to nominal voltages of at least 22kV and less than 132kV.
HV	Nominal voltages of at least 1kV and less than 22kV.
kV	Kilovolt (1,000 Volts): a unit of voltage.
Network level	The network is modelled as a stack of circuit and transformation levels between supplies at LV and the transmission network. A network level is any circuit or transformation level in that stack. An additional network level is used for transmission exit.

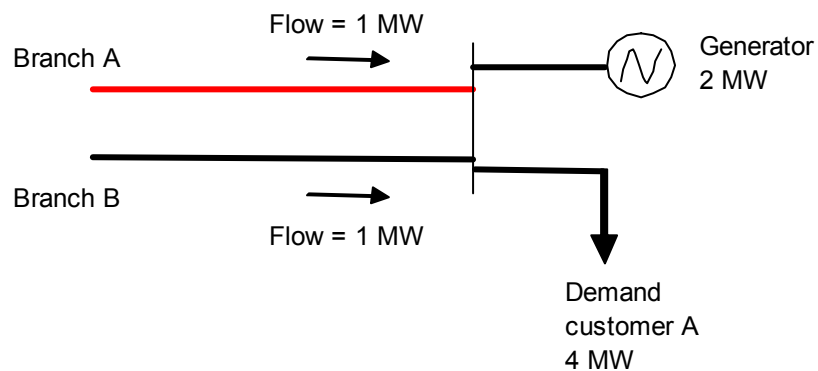
## **Annex 1: Illustrative examples**

1. This annex explains the proposed new method for allocating asset costs using simple illustrations, and compares its results with those from the current EDCM method.
2. We consider the allocation of the costs of an asset to a demand customer under three different types of network configurations:
  - a) Where the asset being used is shared with another demand customer, and there is some unused capacity.
  - b) Where the asset being used is shared with a generator, and the asset is “demand-dominated”.
  - c) Where the asset being used is shared with a generator, and the asset is “generation-dominated”.
3. These configurations are shown in the diagrams overleaf. The diagrams show a simple network section with two branches, Branch A and B. For the purposes of this annex, we are trying to determine the appropriate allocation of the MEAV of Branch A to the demand customer.
4. The rated capacity of Branch A is 12 MVA and its annualised MEAV (AMEAV) is £1 million.

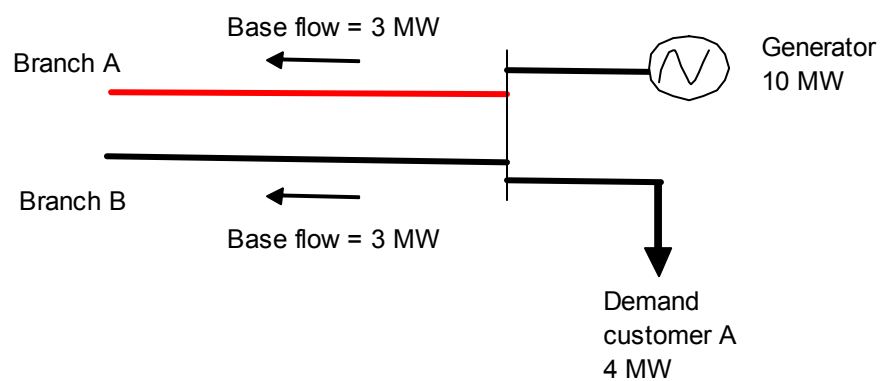
### Example A: Asset shared with another demand customer



### Example B: Demand-dominated asset



### Example C: Generation-dominated asset



5. Table 4 below demonstrates the allocation of the AMEAV of Branch A to demand customer A in each of the three cases shown in the previous page.

**Table 4 Allocation of asset cost to demand customer A under each example**

	<b>Example A</b> <b>(shared with</b> <b>another</b> <b>demand user)</b>	<b>Example B</b> <b>(shared with</b> <b>a smaller</b> <b>generator)</b>	<b>Example C</b> <b>(shared with</b> <b>a bigger</b> <b>generator)</b>
AMEAV of Branch A	£1 million		
Rated capacity of Branch A	12 MVA		
Consumption by the demand customer A under maximum demand conditions	4 MW		
MW usage of Branch A by the demand customer	2 MW		
Total MW usage of Branch A by all demand customers	5 MW	2 MW	2 MW
Base flow through Branch A	5 MW	1 MW	(3 MW)
Maximum post-contingent flow through Branch A	10 MW	2 MW	(6 MW)
Base flow load through Branch A	5 MW	2 MW	2 MW
Ratio 1: MW usage / Total MW usage	0.4	1	1
Ratio 2: Asset utilisation factor	0.83	0.16	0.5
Ratio 3: Load utilisation factor	0.83	0.33	0.33
Asset allocation to demand customer A under proposed method	<b>£333,333</b> (Ratio 1 * Ratio 2) * AMEAV	<b>£166,667</b> (Ratio 1 * Ratio 2) * AMEAV	<b>£333,333</b> (Ratio 1 * Ratio 3) * AMEAV
Asset allocation to demand customer A under current EDCM	<b>£400,000</b> (Ratio 1) * AMEAV	<b>£1 million</b> (Ratio 1) * AMEAV	<b>£1 million</b> (Ratio 1) * AMEAV